VERIFICATION OF A TRANSLATION

I, the below named translator, hereby declare that:

My name and Post Office Address are as stated below;

That I am knowledgeable in the English language and in the language in which the below identified International Application was filed, and that I believe the English translation of the International Application No. PCT/JP99/05814 is a true and complete translation of the above identified International Application as filed.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that theses statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Full name of the translator: Takeshi Oshio

Signature of the translator: Takeshi Oshio

Post Office Address: c/o ITO OFFICE LTD.
Shinjuku Bldg., 8-1,
Nishishinjuku 1-chome,
Shinjuku-ku, Tokyo, Japan

DESCRIPTION

REPRODUCING DEVICE AND RECORDING/REPRODUCING DEVICE

TECHNICAL FIELD

The present invention relates to a reproducing device and a recording/reproducing device. In particular, the present invention relates to a reproducing device and a recording/reproducing device for selectively reproducing data stored in a memory.

BACKGROUND ART

For example, as a language learning system, there is such a one that voice (conversation voice) serving as a teaching material is reproduced to enable a user to learn.

By way of example, a device in which each sentence of English conversation voice or the like is reproduced one by one, according to the operation of a user, or a device in which a user can repeatedly hear a certain sentence is known.

However, using such a reproducing device for learning involves the following inconvenient point.

For instance, let us consider a teaching material for reproducing a series of English conversation voice in every sentence. When this teaching material is composed of the first sentence to the tenth sentence, a user will sequentially reproduce the teaching material from the first sentence to hear the conversation voice.

However, with progress of the learning of a user, when a

user has memorized specific sentences, e.g., the first, fourth and fifth sentences and need not hear those sentences, or when a user does not want to reproduce a specific sentence purposely, the user must expressly perform a fast forward operation in reproduction of the sentence.

The excessive operation needed as described above prevents the user from concentrating on learning. Such a device is not appropriate as a learning system.

When a sentence which need not be heard happens to appear, voice stored for the sentence may be erased. However, in this case, since the sentence cannot be heard later, it is also not appropriate.

The present invention has been made in view of the above problems, and its object is to provide a reproducing device and a recording/reproducing device capable of allowing effective learning to be performed with a simpler operation.

DISCLOSURE OF THE INVENTION

The first invention is a reproducing device comprising a memory in which management data including a plurality of data and flags representing whether at least the plurality of data can be reproduced or not is stored, a reproducing unit for reproducing the data read from the memory, an operation unit having an operating element for setting flags indicating whether the data stored in the memory can be reproduced or not, and a control unit for setting flags on the management data according

to an input from the operator and also performing control of reading the data from the memory and control of a reproducing operation of the reproducing unit in accordance with the management data, wherein, when the data read from the memory is reproduced by the reproducing unit, the control unit causes data other than those on which a flag is raised out of data read from the memory to be reproduced.

The second invention is a reproducing device wherein, in the first invention, the control unit cancels a setting of the flags on the management data when the operating element is operated again.

The third invention is a reproducing device wherein, in the first invention, the operation unit further comprises an additional operating element for performing a fast forward or fast backward operation, and, when the additional operating element is operated to perform a fast forward or fast rewind operation for data read from the memory, the control unit causes the fast forward or fast rewind operation to be performed for data other than those on which a flag is raised out of the data read from the memory when the data read from the memory is reproduced by the reproducing unit.

The fourth invention is a reproducing device wherein, in the first invention, the operation unit further comprises an additional operating element for performing repeat reproduction, and, when the additional operating element is operated to

perform the repeat reproduction for data read from the memory, the control unit causes the repeat reproduction of data to be performed, which excepts data on which a flag is set out of the data read from the memory when the data read from the memory is reproduced by the reproducing unit.

The fifth invention is a reproducing device wherein, in the first invention, the control unit controls the reproducing unit so that a temporary stop state may be brought and also controls reading of data from the memory after reproduction of one data read from the memory by the reproducing unit has finished.

The sixth invention is a reproducing device wherein, in the first invention, the memory is detachably provided on the reproducing device.

The seventh invention is a reproducing device comprising a memory in which management data including a plurality of data and flags indicating whether at least the plurality of data can be reproduced or not is stored, a reproducing unit for reproducing the data read from the memory, an operation unit having an operating element for setting flags indicating whether the data stored in the memory can be reproduced or not, and a control unit for setting flags on the management data according to an input from the operating element and also performing control of reading the data from the memory and control of a reproducing operation of the reproducing unit in accordance with

the management data, wherein the control unit makes reproduce data to be reproduced next to data on which a flag is set if the flags are set on the data read from the memory when the data read from the memory is reproduced by the reproducing unit.

The eighth invention is a reproducing device wherein, in the seventh invention, the control unit cancels a setting of the flags on the management data when the operating element is operated again.

The ninth invention is a reproducing device wherein, in the seventh invention, the operation unit further comprises an additional operating element for performing a fast forward or fast backward operation, and, when the additional operating element is operated to perform a fast forward or fast backward operation for data read from the memory, the control unit causes the fast forward or fast backward operation to be performed for data other than those on which a flag is set out of the data read from the memory when the data read from the memory is reproduced by the reproducing unit.

The tenth invention is a reproducing device wherein, in the seventh invention, the operation unit further comprises an additional operating element for performing repeat reproduction, and, when the additional operating element is operated to perform the repeat reproduction of data read from the memory, the control unit causes the repeat reproduction of data to be performed, which excepts data on which a flag is set out of the

data read from the memory when the data read from the memory is reproduced by the reproducing unit.

The eleventh invention is a reproducing device wherein, in the seventh invention, the control unit controls the reproducing unit so that a temporary stop state may be brought and also controls reading of data from the memory, after reproduction of one data read from the memory by the reproducing unit has finished.

The twelfth invention is a reproducing device wherein, in the seventh invention, the memory is detachably provided on the reproducing device.

The thirteenth invention is a recording/reproducing device comprising a signal processing unit for generating recording data based on a signal supplied from a signal source, a detection unit for detecting a partition portion based on the supplied signal, a memory in to which recording data from the signal processing unit is written and in which management data including flags indicating whether at least the recording data can be reproduced or not is stored, a reproducing unit for reproducing the data read from the memory, an operation unit having an operating element for setting flags for indicating whether the data stored in the memory can be reproduced or not, and a control unit for generating the management data written in to the memory based on a detection result from the detection unit, setting flags on the management data based on an input

from the operating element, performing read out control of the data from the memory and reproduction control of the reproducing unit based on the management data, wherein, when the data read from the memory is reproduced by the reproducing unit, the control unit causes those data to be reproduced which excepts data on which a flag is set out of data read from the memory.

The fourteenth invention is a recording/reproducing device wherein, in the thirteenth invention, the control unit cancels a setting of the flags on the management data when the operating element is operated again.

The fifteenth invention is a recording/reproducing device wherein, in the thirteenth invention, the operation unit further comprises an additional operating element for performing a fast forward or fast backward operation, and, when the additional operating element is operated to perform a fast feeding or fast rewinding operation for data read from the memory, the control unit performs the fast forward or fast backward operation to be performed for data which excepts data on which a flag is set out of the data read from the memory when the data read from the memory is reproduced by the reproducing unit.

The sixteenth invention is a recording/reproducing device wherein, in the thirteenth invention, the operation unit further comprises an additional operating element for performing repeat reproduction, and, when the additional operating element

is operated to perform the repeat reproduction of data read from the memory, the control unit causes the repeat reproduction of data to be performed which excepts data on which a flag is set out of the data read from the memory when the data read from the memory is reproduced by the reproducing unit.

The seventeenth invention is a recording/reproducing device wherein, in the thirteenth invention, the control unit controls the reproducing unit so that a temporary stop state may be brought and also controls reading of data from the memory, after reproduction of one data read from the memory by the reproducing unit has finished.

The eighteenth invention is a recording/reproducing device wherein, in the thirteenth invention, the control unit generates and outputs a control signal for controlling an operation of a signal source based on an input from the operation unit.

The nineteenth invention is a recording/reproducing device wherein, in the thirteenth invention, the signal supplied from the signal source is composed of a first channel signal component including a signal component converted into recording data by at least the signal processing unit and a second channel signal component indicating a partition portion of the first channel signal component.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is an illustration for explaining the appearance

of a reproducing device according to the first embodiment of the present invention.

FIG. 2 is a block diagram of the configuration of the reproducing device according to the first embodiment.

FIG. 3 is a chart of segment data and management information stored in a memory of the embodiment.

FIG. 4 is a chart of a reproducing operation of the embodiment.

FIG. 5 is a flow chart of processes in a reproducing operation of the embodiment.

FIG. 6 is a flow chart of processes in a skip operation of the embodiment.

FIG. 7 is a flow chart of processes in a clear operation of the embodiment.

FIG. 8 is a flow chart of processes in a fast forward operation of the embodiment.

FIG. 9 is a flow chart of processes in a fast backward operation of the embodiment.

FIG. 10 is an illustration for explaining the appearance of a reproducing device according to the second embodiment of the present invention.

FIG. 11 is a block diagram of the configuration of the reproducing device according to the second embodiment.

FIG. 12 is an illustration for explaining the appearance of a reproducing device according to the third embodiment of the

present invention.

FIG. 13 is a block diagram of the configuration of the reproducing device according to the third embodiment.

FIG. 14 is a chart for explaining a dedicated disk and a general disk used in the third embodiment.

FIG. 15 is a chart for explaining a partition signal of the dedicated disk used in the third embodiment.

FIG. 16 is a flow chart of a recording process of the third embodiment.

BEST MODE FOR CARRYING OUT THE INVENTION

Preferred embodiments in which a reproducing device according to the present invention is applied to a learning device for, e.g., English conversation or the like will be described below. As the embodiments three kinds of examples are cited, each of which will sequentially be described below.

(First Embodiment)

A reproducing device as a first embodiment will be described below with reference to FIGS. 1 to 9.

FIG. 1 shows an appearance of the reproducing device according to this embodiment.

An illustrated reproducing device 1 is, e.g., a compact and light-weight device which is suitably portable and has a structure in which a user connects a headphone device 20 to the reproducing device 1 to hear reproduced voice which is reproduced and output from the reproducing device 1.

On the housing of the reproducing device 1, a display 2 made of, e.g., a liquid crystal panel is arranged. On the display 2 are displayed text and the like corresponding to an operation mode, an operation state, the number of a reproduced segment, and reproduced voice as a segment. A segment means herein, e.g., a reproduction unit which are set apart at about every one sentence of conversation voice and corresponds to a program termed in the present invention. Although it will be described below, in an internal memory 26 is stored voice forming a teaching material such as conversation voice as managed in units of segments.

A volume dial 3 is arranged in the reproducing device 1, so that a user can adjust the volume of reproduced voice output from the headphone device 20 by adjusting the volume dial 3.

A plurality of operating elements for a user to perform reproduction and other various operations by a user are arranged on the housing of the reproducing device 1. Specifically, the plurality of operating elements include a reproduction/pause key 4, a stop key 5, a fast backward key 6, a fast forward key 7, a repeat key 8, a display mode key 9, a skip key 10, a clear key 11 and so on as shown in FIG. 1.

The reproduction/pause key 4 is a key for directing to reproduce a segment. When the reproduction/pause key 4 is pressed by a user during reproduction, a temporary stop operation of a reproducing operation of a segment reproduced by

the reproducing device 1 takes place. During the temporary stop of the reproduction, the reproduction/pause key 4 is pressed by the user again to restart reproduction of the sentence, which is temporarily stopped.

The reproducing operation by the reproducing device 1 is performed in each of segments. At the end of reproduction of a segment, the reproducing device 1 automatically turns into a temporary stop state.

For example, when the reproduction/pause key 4 is pressed, the first segment is reproduced and the reproducing device 1 is set in a temporary stop state at the end of the reproduction of the first segment. At this moment, when the reproduction/pause key 4 is pressed by the user again, the second segment is reproduced, and the reproducing operation of the reproducing device 1 is temporarily stopped at the end of the reproduction of the second segment. In this manner, since reproduction of segments proceeds in each of segments according to the pressing operation of the reproduction/pause key 4, the user can go ahead with learning while checking/considering each segment at user's pace.

The reproduction/pause key 4 also acts as a power supply key. When the reproduction/pause key 4 is pressed in a power off state, the power supply of the reproducing device 1 is turned on to start reproduction of segments.

The stop key 5 is an operation key for stopping

reproduction of segment. In the reproducing device 1 according to this embodiment, the power supply of the reproducing device 1 is automatically turned off when a predetermined period of time has passed without user's operating the operating element after the reproducing operation of the segments has stopped.

The fast backward key 6 and the fast forward key 7 are operation keys for performing a feeding operation with respective to reproducing operation in every segment. For example, each time the fast forward key 7 is pressed, reproduction of the segment is forwarded to the segment of next number or the segment to be reproduced next. When the fast backward key 6 is pressed, the reproduced portion is returned to the start position of the segment which is being reproduced at present. When the fast backward key 6 is subsequently operated, a segment to be reproduced is shifted backward to the segment of the previous number or the segment previously reproduced. While the fast backward key 6 or the fast forward key 7 is pressed to be operated by the user, the fast forward or fast backward operation of the segments are continued.

The repeat key 8 is an operation key for performing an operation of repeatedly reproducing the just previously reproduced segment again. In other words, the pressing of the repeat key 8 causes repeated reproduction to be performed from the start of the just previously reproduced segment.

The immediately previous segment may be repeatedly

reproduced an endless number of times in response to the operation of the repeat key 8. However, in this embodiment, the number of times of repeat reproduction performed by operating the repeat key 8 is set at only once. When the repeat key 8 is pressed again after repeat reproduction, it is arranged that the operation is shifted forward to reproduction of the next segment. For example, when the repeat key 8 is continuously operated immediately after the reproduction of, e.g., the first segment, the reproducing operation goes ahead in such a manner as repeat reproduction of the first segment → reproduction of the second segment → repeat reproduction of the second segment → reproduction of the third segment → repeat reproduction of the third segment, and so on.

The display mode key 9 is an operation key for switching the display states of the display 2.

The skip key 10 and the clear key 11 are operating elements for setting and canceling a skip flag described below.

In addition, the structure of the various operating elements described above is only an example. As a matter of course, an operating element having another operation contents may be formed, or operating elements having different structures (e.g., a dial-type operating element or the like) may be arranged.

Alternatively, other operating elements may be

substituted for a specific operation. For example, it is arranged so that when the skip key 10 is not provided and the stop key 5 and the display mode key 9 are simultaneously pressed, this operation may form the setting operation of the skip flag.

The headphone device 20 is connected to the headphone jack 14. Specifically, when a plug 20P of the headphone device 20 is connected to the headphone jack 14, stereo or monaural analog reproduced audio signals output from the reproducing device 1 can be supplied to the headphone device 20 to be output as voice.

FIG. 2 shows the internal construction of the reproducing device 1.

A control unit 21 is constituted by a microcomputer to control the operation of the entire reproducing device 1.

An operation unit 22 is constituted by the various operating elements 4 to 11. Operation input information resulting from operating these operating elements 4 to 11 is supplied to the control unit 21. The control unit 21 executes a required control operation corresponding to an operating element operated according to the inputted operation input information and an operation program retained in an internal ROM. In other words, the reproducing operation corresponding to the operated operating element or a switching operation between display operations in the display 2 is executed.

An internal memory 26 is formed from, e.g., a semiconductor memory. Audio data such as the voice of English conversation teaching materials are managed in each of segments and stored in the storage area of the memory 26 as described above. In the internal memory 26, management information for managing these audio data is also stored.

When performing a reproducing operation of the segments, the control unit 21 reads predetermined audio data from the internal memory 26 with reference to the management information in the internal memory 26. An audio signal serving as a segment is stored in the internal memory 26 for audio data compressed by a predetermined compress encode process. For this reason, the audio data read from the internal memory 26 is subjected to expansion for the compression and a decode processing by a decoder 31. The digital signal decoded by the decoder 31 is supplied to a D/A converter 24 to be converted into an analog voice signal.

The analog audio signal output from the D/A converter 24 is subjected to amplification, impedance adjustment, level adjustment, etc. by an audio circuit 25 and supplied to the headphone jack 14. In this manner, the analog audio signal is supplied to the headphone device 20 connected to the headphone jack 14 and reproduced voice is output from the headphone device 20. In the level adjustment by the audio circuit 25, a variable resistor connected to the volume dial 3 is adjusted in order to

adjust a volume output from the headphone device 20.

The control unit 21 causes the display 2 to display the passage of reproduction time, the number of a segment, etc. depending on an operation state such as the reproducing operation of segments when the power of the reproducing device 1 is on. For this purpose, the control unit 21 supplies to a display drive unit 23. display data for performing the time display or the display of segment number. The display drive unit 23 drives the display 2 according to the supplied display data to cause the display 2 to display a reproducing operation mode, the number of a segment under reproduction or the like.

Data storage forms in the internal memory 26 are shown in FIGS. 3(a) and 3(b).

FIG. 3(a) shows schematically the storage areas of the internal memory 26 as addresses A0 to An2. First of all, a specific storage area, e.g., a storage area having address A0 at the head in the internal memory 26 is defined as a management area, in which management information is stored.

Subsequent to the management area having address A0 at the head, audio data forming main data is stored in segments SG#1 to SG#n. One segment includes audio data corresponding to one sentence composing, for example, conversation. For example, one conversation teaching material is formed from segments SG#1 to SG#n

The storage capacity of the internal memory 26 is set

at, e.g., 1 Mbyte (8 Mbits). When audio data is stored in a predetermined compressed format and the main data (segments SG#1 to SG#n) forming the conversation teaching material is actually reproduced as, e.g., monaural audio data, audio data for about three minutes can be stored therein.

FIG. 3(b) shows an example of management information stored in the management area.

As the management information, skip flags, start addresses, end addresses, and text data are stored corresponding to segment numbers.

To begin with, storage positions of segments in the internal memory 26 are managed by start addresses and end addresses.

For example, the first segment SG#1 is stored in the area between addresses A11 and A12 as shown in FIG. 3(a). This is managed in the management information shown in FIG. 3(b) so that the start address and the end address of the first segment SG#1 are A11 and A12, respectively. The segment SG#2 and the other subsequent segments are stored in the same manner as the above described segment SG#1.

Specifically, the control unit 21 grasps the start addresses and the end addresses of each segment with reference to the management information stored in the management area of the internal memory 26, so that a reading/reproducing operation of a required segment from the internal memory 26 can be

executed.

In the example shown in FIG. 3(b), text data corresponding to the voice of each segment are stored in the management information. When the text data are stored as described above, in reproduction of a segment, the control unit 21 reads the text data corresponding to the segment to supply those data to the display drive unit 23. Thus, texts corresponding to reproduced voice can be displayed on the display 2.

When no text data corresponding to a segment is stored, a segment number or the like may be displayed on the display 2.

In the management information, a storage area for storing a skip flag corresponding to each segment is prepared. In the example shown in FIG. 3(b), the initial state of the skip flag is set at "1". However, when a flag setting operation is performed, the skip flag is changed or rewritten into "0". In other words, "0" represents a state in which a skip flag (described below) is raised.

The skip flag is raised by operating the skip key 10 (described above) when a user decides that a certain segment need not be reproduced, e.g., when the segment of an English conversation teaching material has already been memorized.

For example, in the initial state (when skip flag is set at "1" with all the segments), each time the reproduction/pause key 4 is pressed, reproduction of segments and automatic

temporary pause are performed as described above. In other words, when a user sequentially presses the reproduction/pause key 4, the segments stored in the internal memory 26 can be sequentially reproduced.

This reproducing operation is schematically shown in FIG. 4(a).

FIG. 4(a) shows a case in which, when the skip flags on all the segments are set at "1", i.e., when the skip flags are not raised, a user performs a reproducing operation (arrow PB). The segment SG#1 is reproduced by the first operation PB1 of the reproduction/pause key 4, and the reproduction is temporarily stopped with the end of the reproduction of the segment SG#1.

Subsequently, when the user performs an operation PB2 of the reproduction/pause key 4, the next segment SG#2 is read from the internal memory 26 and reproduced. Similarly, upon completion of reproduction of the segment SG#2, the reproduction is temporarily stopped.

In the same manner as described above, the following segments are sequentially reproduced according to operations PB3, PB4 etc. of the reproduction/pause key 4.

However, when the user understands that the segments SG#2, SG#4 and SG#5 need not be reproduced because these segments have been sufficiently learned, the user performs the operation of the skip key 10 for the segments SG#2, SG#4 and SG#5. The skip flags are raised in a manner that the skip key

10 is operated while a segment number to be skipped is displayed on the display 2. Then, the skip flag of the skip number displayed on the display 2 is changed from "1" to "0".

Herein, as shown in FIG. 3(b), a state in which skip flags are raised for the segments SG#2, SG#4 and SG#5 (= "0") is established.

The operation performed when the skip flags are raised is shown in FIG. 4(b). The segment SG#1 is reproduced by the first operation PB1 of the reproduction/pause key 4, and the reproduction is temporarily stopped with the end of the reproduction of the segment SG#1.

Subsequently, when a user performs the operation PB2 of the reproduction/pause key 4, because a skip flag is raised for the next segment SG#2 as shown in FIG. 3(b), the segment SG#2 is skipped and the segment SG#3 is reproduced. The reproduction is temporarily stopped with the end of the reproduction of the segment SG#3.

When the user further performs the operation PB3 of the reproduction/pause key 4, because skip flags are raised for the next segment SG#4 and the segment SG#5 after the next as shown in FIG. 3(b), the segments SG#4 and SG#5 are skipped and a segment SG#6 is reproduced. The reproduction is temporarily stopped with the end of the reproduction of the segment SG#6.

In this way, when a skip flag in the management information is set at "0" with the operation of the skip key 10

by the user, the reproduction of the segment for which the skip flag is set at "0" is skipped in reproduction. The processing of the control unit 21 for implementing the above reproducing operation will be described below with reference to FIG. 5 to FIG 9.

FIG. 5 shows processings performed when the reproduction/pause key 4 is operated from the power OFF state, and then the reproduction/pause key 4 or the repeat key 8 is operated.

When the reproduction/pause key 4 is pressed from the power OFF state, the control unit 21 shifts the processing from step F101 to F102 to perform a power ON processing, and sets a variable m representing a segment forming an object to be reproduced equal to 1 at step F103. The numeral value of the variable m corresponds to a segment number.

While the processing goes ahead to the reproduction of the first segment SG#1, the skip flag of the segment SG#m is checked at step F104. Since the variable m = 1, it is checked whether the skip flag of the segment SG#1 is raised or not.

If the skip flag is "1", i.e., if no flag is raised, the processing advances to step F105 to reproduce the segment SG#m. Upon completion of the reproduction of the segment SG#m, the reproduction is temporarily stopped at step F106.

In the processing so far, the first segment SG#1 stored in the internal memory 26 has been reproduced.

At a time point when the reproduction is in pause, the operation of the reproduction/pause key 4 and the operation of the repeat key 8 are monitored through the loop of steps F107 and F108.

When the reproduction/pause key 4 is pressed by a user, the variable m is incremented at step F110 and the processing returns to step F104. Then, the skip flag of the next segment is checked as the segment SG#m. When the skip flag is not raised, i.e., when the skip flag is "1", the next segment of the segment SG#m is executed at step F105.

For example, a reproducing operation of a segment, i.e. audio data stored in the memory 26 when no skip flags are raised for all the segments as shown in FIG. 4(a) is executed in a manner that the above processings are repeated.

However, when the skip flag of a certain segment is raised as shown in FIG. 4(b), it is decided at step F104 that a skip flag is raised at a certain point time (at a time point when the value of m becomes the number of the segment in which the skip flag is raised).

When the skip flag is raised, the processing goes ahead to step F110, the variable m is incremented and the skip flag of the segment after the variable m has been incremented is checked again at step F104.

In other words, since the variable m is renewed to the next segment number without going to step F105, the segment in

which the skip flag is raised will not be reproduced.

For this reason, when the skip flags of the segments SG#2, SG#4 and SG#5 are raised as shown in FIG. 4(b), the processing will not proceed to step F105 at time points when the values of the variables m are equal to 2, 4 and 5. As described above with reference to FIG. 4(b), according to the operation of the reproduction/pause key 4, the segments are reproduced in the order of SG#1 → SG#3 → SG#6....

Because reproduction of the segments stored in the internal memory 26 is advanced as described above a segment a user which decided that reproduction is unnecessary to raise a skip flag will not automatically be reproduced without a user's special operation. That is to say, it is handled as if no segment exists, so that the operation by the user will be made much simpler.

By the way, when the operation of the repeat key 8 is detected in the loop of steps F107 and F108, it is decided at step F109 whether the time point of the operation is immediately after repeat reproduction or not.

If the time point is not immediately after repeat reproduction, the processing returns to step F105 to reproduce the segment SG#m. In other words, the segment SG#m which is reproduced just previously will be repeatedly reproduced.

On the other hand, if the time point is immediately after repeat reproduction, the variable m is incremented at step

F110 and the processing goes to step F105 through the decision at step F104 (the variable m is further incremented depending on the skip flag). Accordingly, the next segment (segment in which no skip flag is raised) is reproduced.

In this way when the repeat key 8 is continuously operated after reproduction of some segment as described above, reproduction goes on as follows:

repeat reproduction of a just previously reproduced segment → reproduction of the next segment → repeat reproduction of the next segment → reproduction of a segment after the next segment → repeat reproduction of a segment after the next segment → ....

Even if the reproduction of segments goes on by the operation of the repeat key 8 in this manner, reproduction of a segment in which a skip flag is raised will be omitted by the processings at steps F104 and F110.

Although not expressed in this flow chart, after a time point when the reproduction proceeds to complete reproduction of the final segment stored in the internal memory 26 (at a time point after the variable m has become the final segment number), if the reproduction/pause key 4 is operated again, the reproduction may be shifted to the first segment by setting the variable m = 1. Otherwise, it may be decided that the reproduction of all the segments stored in the internal memory

26 has finished and the operation of the reproduction/pause key 4 is invalid.

When the stop key 5 is operated in the middle of reproduction or in a reproducing process of repeat reproduction, etc. of some segment the power supply will be turned off upon completion of the reproduction or the reproducing process of the segment.

In addition, when the reproduction/pause key 4 is pressed during the reproduction at step F105, the reproduction is temporarily stopped, or turns into a so-called pause state. When the reproduction/pause key 4 is pressed again, the reproducing operation of the segment which is interrupted is will be resumed.

Now, in order to raise a skip flag, a user must operate the skip key 10.

For example, when a user made some segment to be reproduced, if the user decides that reproduction of the segment is unnecessary in future the user than operates the skip key 10.

In this case, when the skip key 10 is operated, the processing of the control unit 21 proceeds from step F201 to step F202 in FIG. 6, where it is checked first whether a certain segment is selected or not. The state in which the segment is selected indicates state in which a segment SG#m is reproduced according to, e.g., the variable m or a state in which the reproduction is completed and in pause by the processing at step

F106.

In such a segment selected state, the operation of the skip key 10 is made valid. The processing goes to step F203, and, for the selected segment SG#m, the processing in which the skip flag of the management information of the internal memory 26 is set or changed to "0" is performed.

In this manner, the skip flag of the segment SG#m is raised in the management information of the internal memory 26.

If a user presses the clear key 11, then all the skip flags raised in the management information of the internal memory 26 can be cleared.

When the clear key 11 is pressed by the user, the processing of the control unit 21 advances from step F301 to step F302 in FIG. 7 and all the skip flags of the management information in the management area of the internal memory 26 are initialized.

Thus, even if a skip flag for some segment is raised as in the example shown in FIG. 4(b), it can be returned to the state in FIG. 4(a), i.e., the state in which all the skip flags = "1". In other words, a segment which is set not to be reproduced can be returned to the state in which the segment is reproduced again.

During the reproduction or the temporary stopping at steps F105 and F106 in FIG. 5 as described above, the user may operate the fast forward key 7 or the fast backward key 6.

The processing of the control unit 21 performed when the fast forward key 7 is operated will first be described below with reference to FIG. 8.

When the fast forward key 7 is operated, the control unit 21 moves the processing forward from step F401 to step F402 in FIG. 8, increments the variable m, and checks a skip flag for the segment SG#m at step F403. If the fast forward key 7 is not operated at step F401, the control unit 21 turns into a waiting state until the fast forward key 7 is operated, or the control unit 21 turns into a waiting state until an operating element for performing a reproducing operation including a fast forward operation is operated.

When no skip flag is raised for the segment SG#m, the control unit 21 waits a predetermined period of time (e.g., set at 2 to 3 seconds or so). If the fast forward key 7 is not operated during that predetermined period of time, the processing proceeds to step F105 in FIG. 5 to reproduce the segment SG#m.

Therefore, for example, in a state in which the skip flags of all the segments are not raised as shown in FIG. 4(a), if the fast forward key 7 is operated once during reproduction or temporary stopping of the segment SG#1, the segment SG#2 will be reproduced.

However, the fast forward key 7 may also be operated continuously. In this case, a fast forward operation is detected

at step F405 again within the waiting time at step F404. The variable m is incremented at step F402 again, the skip flag being checked at step F403, and the processing proceeds to step F404.

Therefore, for example, when the fast forward key 7 is continuously operated three times during reproduction or temporary stop of the segment SG#1, the segment SG#4 will be reproduced.

On the other hand, when a skip flag is raised for some segment as shown in FIG. 4(b), the processing will not proceed from step F403 to step F404 at a time point when the variable m becomes the segment number, and the variable m is incremented again at step F402.

Therefore, as concerns the fast forward operation also, the segment for which the skip flag is raised will not be reproduced. For example, in FIG. 4(b), when the fast forward key 7 is operated once during the reproduction or temporary stopping of the segment SG#1, the segment SG#3 will be reproduced. For example, when the fast forward key 7 is continuously operated twice during the reproduction or temporary stopping of the segment SG#1, a segment SG#6 will be reproduced.

The processing of the control unit 21 performed when the fast backward key 6 is operated during the reproduction and temporary stopping at steps F105 and F106 in FIG. 5, as described above, will be described below with reference to FIG.

9.

When the fast backward key 6 is operated, the control unit 21 moves the processing forward from step F501 to step F502 in FIG. 9, and waits a predetermined period of time (e.g., about 2 to 3 seconds) to check whether the fast backward key operation is continuously performed or not. If the fast backward key 6 is not operated again during that predetermined period of time, the processing proceeds to step F105 in FIG. 5 to reproduce the segment SG#m. In this case, a segment which is being reproduced or has been reproduced to be temporarily stopped will be reproduced from the start position. If the fast backward key 6 is not operated at step F501, the control unit 21 goes into a waiting state until the fast backward key 6 is operated, or the control unit 21 goes into a waiting state until an operating element for performing another reproducing operation including a fast backward operation is operated.

When the fast backward key is continuously operated a plurality of times, the processing proceeds from step F503 to step F504 at each operation to decrement the variable m. The skip flag of the segment SG#m is checked at step F505.

If the skip flag of the segment SG#m is not raised, the control unit 21 waits a predetermined period of time at step F502. If the fast forward key 7 is not operated again in that predetermined period of time, the control unit 21 waits a predetermined period of time at step F502. If the fast forward

key 7 is not operated again in that predetermined period of time, the processing proceeds to step F105 in FIG. 5 to reproduce the segment SG#m.

Therefore, when the backward key 6 is continuously operated three times during reproduction or temporary stopping of the segment SG#3 while skip flags for all the segments are not raised as shown in FIG. 4(a), the segment SG#1 will be reproduced.

On the other hand, when the skip flag for some segment is raised as shown in FIG. 4(b), the processing will not proceed from step F505 to step F502 at a time point when the variable m becomes the segment number of that segment, and the variable m is decremented at step F504.

Therefore, as for the fast backward operation also, a segment for which a skip flag is raised will not be reproduced. For example, in FIG. 4(b), when the fast backward key 6 is continuously operated twice during reproduction or temporary stopping of the segment SG#6, the segment SG#1 will be reproduced.

As described above, even in fast forward and fast backward operations, the segment for which a skip flag is raised is handled as if the segment is absent, so that the user's operation can be simplified.

This embodiment is arranged so that, in the fast forward and fast backward operations, segments may be reproduced

depending on the number of times of the operation of the fast forward key 7 or the fast backward key 6. However, for example, when a fast forward or fast backward operation is performed during reproduction pause, only increment, decrement, etc. of the variable m may be performed as a processing and actual reproduction may be started after the reproduction/pause key 4 is pressed.

For example, when a segment number displayed on the display 2 is renewed depending on the increment/decrement of the variable m, a user can check a shift in segment by the fast forward or fast backward operation. As a result, the user can perform a reproducing operation while checking whether a displayed segment number in the display 2 is a desired segment or not.

(Second Embodiment)

A second embodiment will be described below with reference to FIGS. 10 and 11.

In the foregoing description of the first embodiment, renewal of audio data as the segment of the memory 26 has been not referred to. However, if a means for writing voice as a segment into the memory 26 is not provided, only one sort of audio data can be provided as a segment which is a teaching material.

If the memory 26 can be composed to have such a very large storage capacity that a very large number of sorts of

teaching materials can be stored, no problem will occur. However, in the reproducing device according to the present invention, a user will select arbitrary one teaching material from a multiplicity of teaching materials. For this reason, on that occasion, the data forming as the teaching material must be stored from the outside into the memory 26 before using the reproducing device 1. Accordingly, although not described, it must be made possible for teaching material data to be loaded into the internal memory 26 by some interface means. However, in this case, the data of a teaching material must be probably loaded into the internal memory 26 each time teaching materials are exchanged. In the second embodiment, a portion corresponding to the internal memory 26 is replaced by a detachable memory card 50 as shown in FIG. 10 so that a user can select his/her favorite teaching material.

Specifically, as the memory card 50, various teaching materials such as English conversation for a beginner's course, English conversation for an intermediate course, English conversation for an advanced course, German conversation, and so on are prepared. A user obtains a memory card recording a teaching material which the user wants to learn by purchasing or the like, and installs the memory card in a reproducing device 1A.

For this purpose, as shown in FIG. 10, the reproducing device 1A has a memory slot 15 into which the memory card 50 is

inserted to be installed.

While an internal construction of the reproducing device 1A is shown in FIG. 11, the reproducing device 1A differs from the reproducing device 1 shown in FIG. 2 only in that a memory card drive 27 is provided to make it possible to access the memory card 50 installed in the memory slot 15. The same reference numerals symbols as in the reproducing device 1 shown in FIG. 2 denote the same parts in the reproducing device 1A, and a detailed description thereof will be omitted herein.

Since the detailed description of the operation of the reproducing device 1A is the same as that of the reproducing device 1 as the first embodiment, it will be omitted. However, in the memory card 50, the management information and segments are stored as shown in FIG. 3 described above. A control unit 21 can reproduce the respective segments, can raise a skip flag in some segment with the user's operation of a skip key 10, and can perform the processing for inhibiting the segment in which the skip flag is raised from being reproduced.

Therefore, the reproducing device 1A of the second embodiment can achieve the same advantages as those in the first embodiment and also can execute a change of teaching material by only exchanging memory cards 50, this forming a convenient reproducing device.

(Third Embodiment)

Subsequently, the reproducing device 1B as a third

embodiment will be described with reference to FIGS. 12 to 16. As will be described below, since the reproducing device 1B according to the third embodiment has a recording system, the reproducing device 1B is not a reproducing device in the strict sense, but a recording/reproducing device. However, the description will be given below as a mere reproducing device 1B.

In this embodiment, the reproducing device 1B is connected to an external reproducing device, e.g., a disk player, so that segment data as a teaching material stored in an internal memory 26 of the reproducing device 1B can be rewritten.

Specifically, a medium on which voice for a teaching material is recorded is provided as a disk, e.g. an optical disk. A user reproduces the teaching material recorded on the disk with a disk player 80 to record the teaching material on the memory 26 inside the reproducing device 1B, so that the user can learn the teaching material with the reproducing device 1B.

The reproducing device 1B is further provided with a recording key 12 and an operation mode key 13 as shown in FIG. 12, as operating elements in addition to those described with FIG. 1.

The recording key 12 is a key for performing an operation for instructing recording of audio data such as a teaching material reproduced by the disk player 80, and the operation mode key 13 is a key for switching an operation mode

between a reproduction mode and a recording mode.

A connection cord 70 for connecting the disk player 80 to the reproducing device 1B is prepared. The connection cord 70 has at its both ends connector units 71 on which audio terminal portions 72 and control terminal portions 73 are formed.

The reproducing device 1B is provided with a connector jack 16 for connecting the connector unit 71 thereto.

On the disk player 80 side, the connector unit 71 is connected to a so-called headphone remote control terminal 81, and analog audio signal which is reproduced by the disk player 80 and normally output to a headphone device is supplied to the audio terminal portion 72. A control signal can be exchanged between the control terminal portion 73 and the reproducing device 1B. The headphone remote control terminal 81 herein indicates a terminal to which an article provided with a remote control unit in the middle of the connection code of a headphone device 20 as shown in FIG. 12 is connected.

Specifically, the control terminal portion 73 has a power supply terminal, a ground terminal, a display data terminal, and a command terminal.

FIG. 13 shows the internal construction of the reproducing device 1B. The same reference numerals as in FIG. 2 denote the same parts in FIG. 13, and a description thereof will be omitted.

The example shown in FIG. 13 differs from the

reproducing device shown in FIG. 2 in that the former has a recording system for an audio signal from the disk player 80 and a command interface system.

As described above, the disk player 80 is connected to the connector jack 16 of the reproducing device 1B through the connection cord 70.

To the audio terminal portion 72 are supplied L and R stereo analog audio signals (AA(L), AA(R)) reproduced and output by the disk player 80.

When the reproducing device 1B is set in a recording mode, the analog audio signals AA(L) and AA(R) output from the disk player 80 and input from the connector jack 16 are converted into digital audio signals by an A/D converter 29 and then subjected to a predetermined compression processing by a compression encoder 28. The compressed data output from the compression encoder 28 is supplied to the control unit 21 as recording data D REC and written into the memory 26 as segment data.

The R channel analog audio signal AA(R) is supplied to a partition detection unit 30, where an operation of detecting a partition signal (described below) is performed. The detection results is notified to the control unit 21.

The control unit 21 and a controller in the disk player 80 transmits and receives to each other commands or display data through the control terminal 73.

For example, in the recording mode, the data of a track number reproduced by the disk player 80 is transmitted as display data to be displayed on the display 2, and the control unit 21 transmits a command CMD for instructing a reproducing operation on the disk player 80 side to the disk player 80.

In this context, a disk, e.g., an optical disk or a magneto-optical disk reproduced by the disk player 80 will be described below.

In general, pieces of music or the like are recorded on the disk in units of "tracks". In other words, in case of music, one piece of music is managed and recorded as one track.

For example, as shown in FIG. 14(a), when a disk on which tracks TK#1 to TK#6 are recorded is considered, each of the tracks TK#1 to TK#6 forms one piece of music. As a matter of course, the tracks are not limited to music. For example, a series of conversation voice of an English conversation material or the like may be recorded as one track.

In any case, as shown in FIG. 14(c), music, conversation voice, and the like are recorded on the respective tracks as of the disk as stereo audio data of L channel and R channel.

On the other hand, the reproducing device 1B according to this embodiment reproduces, audio data recorded on the memory 26 in units of segments as in the reproducing device 1 according to the first embodiment. The storage capacity of the memory 26 is designed to be about 3 minutes in terms of, e.g., compressed

audio data such as monaural voice. Therefore, one segment forms a unit of digital data having a very short reproduction time length. For example, when one sentence of conversation voice is set at one segment, the reproduction time of one segment becomes several seconds to about 10 seconds.

For this reason, it is possible but actually not proper to make one track of the disk correspond to one segment.

In view of the above points, a dedicated disk for recording a teaching material is prepared for the reproducing device 1B.

In case of the dedicated disk, for example, as shown in FIG. 14(b), conversation voice is recorded on L channel of one track, and also a partition signal Q is recorded on R channel to make a partition of conversation voice.

The partition signal Q, for example as shown in FIG. 15, is a signal (audio signal) made by sine signal of 10 kHz recorded three times at 0.1-sec intervals. The signal is inserted at a time immediately before one sentence of conversation starts in L channel.

That is to say, this partition signal Q represents a partition timing of segments when the voice of the teaching material recorded on L channel of the dedicated disk is recorded on the memory 26 inside the reproducing device 1B. The control unit 21 divides the voice to be recorded into segments at timings when partition signals are obtained, and produces

management information in units of segments as shown in FIG. 3(b).

Additionally, the partition signal Q may be special audio data which is considered to be scarcely generated in usual music or voice, and is not limited to the audio signal as shown in FIG. 15.

In this manner, the dedicated disk is a disk on which the voice of a teaching material and the partition signal Q are recorded on the L channel and R channel, respectively, in which one track composes one teaching material.

For example, the track TK#1 of the dedicated disk has contents such as a beginner's course of English conversation; the track TK#2 has contents such as an intermediate course of English conversation; and so on. A user records a track on which a teaching material that the user wants to learn in the memory 26 of the reproducing device 1B. As a matter of course, the reproduction time of one track falls within a length which can be stored in the memory 26, e.g., within 3 minutes.

For example, when the track TK#1 (beginner's course of English conversation) is recorded in the memory 26, the data recorded in the memory 26 is divided into segments at each time when the partition signal Q recorded on R channel of the track is discriminated by the partition detection unit 30.

As has been described above, in the third embodiment, a skip flag can be raised so that a segment decided by a user that

it need not be reproduced may be inhibited from being reproduced.

Therefore, if data on some track recorded from a disk is not divided into segments in the memory 26 (although all the tracks can be continuously reproduced), an advantage obtained by raising a skip flag as described above cannot be achieved. For this reason, a dedicated disk has audio data recorded in such a form shown in FIG. 14(b) that the audio data is properly divided into segments.

An example of the processing of the control unit 21 performed when voice used as a teaching material is reproduced from a disk installed in the disk player 80 and recorded in the memory 26 will now be described with reference to FIG. 16.

When the reproducing device 1B is connected to the disk player 80 through the connection cord 70, if a user sets a recording mode with the operation mode key 13, reproduction by the disk player 80 and recording processing by in the reproducing device 1B will start in response to user's operation of the recording key 12. In the recording processing, since the control unit 21 controls the operation of the disk player 80, the user may perform only the operation on the reproducing device 1B side.

Specifically, after the operation mode key 13 is switched to the recording mode, when the operation of the recording key 12 is detected, the processing of the control unit

21 proceeds from step F601 to step F602 to generate a command CMD first and cause the disk player 80 to set its output level on a predetermined level. For since an analog audio signal output from the disk player 80 as headphone output voice is an object of recording, if the disk player side sets a headphone output volume at zero or a low level, no good recording will be performed. Thus, an output level is specified first in the recording processing. When the recording key 12 for setting a recording mode is not operated at step F601, a recording stand by state is entered.

Subsequently, at step F603, the control unit 21 causes the disk player 80 to execute access to the head of a track to be reproduced.

A track reproduced on the disk player side is selected by a user before the recording key 12 is operated. This selecting operation is performed using the fast forward key 7 and the fast backward key 6 of the reproducing device 1B. In other words, when the fast forward key 7 and the fast backward key 6 are operated in the recording mode, the control unit 21 regards the operation as a track selecting operation on the disk player 80 side and generates a command for instructing the disk player 80 to increment/decrement a track number to be reproduced.

Subsequently, at step F604, the control unit 21 sends a command to the disk player 80 so as to begin reproduction of a

specified track.

In response to the command, the disk player 80 starts a reproducing operation of the disk, and reproduced stereo audio signals of L and R channels are input from the connector jack 16.

At this moment, the control unit 21 checks first detection results of the partition detection unit 30 on the basis of R channel signal to confirm whether or not a partition signal Q is detected from R channel audio signal at the starting time point of reproduction.

If the disk reproduced in the disk player 80 is a dedicated disk described with FIGS. 14(a) to 14(c), the partition signal Q is recorded at every head position of the segments as shown in FIG. 14(b),. For this reason, if the partition signal Q is not detected at the start of reproduction, e.g., in several seconds, it can be decided that an ordinary disk which is not a dedicated disk is being reproduced.

In this embodiment, when it is decided that the ordinary disk is being reproduced, the processing proceeds to step F606 to stop the recording processing.

That is to say, this method permits only the dedicated disk to be recorded. When a track is recorded from the ordinary disk, a proper segment division cannot be performed because of the absence of the partition signal Q, so that proper data as a teaching material cannot be recorded. This is the reason why the

recording is made impossible.

When the partition signal Q is detected immediately after the start of reproduction by the disk player 80, the currently reproduced disk is a dedicated disk. Accordingly, the processing proceeds to step F607 to begin the processing of recording an audio signal input as L channel. Specifically, after the L channel audio signal is converted into a digital signal by the A/D converter 29, the digital signal is subjected to a compression processing by the compression encoder 28 and stored in the memory 26.

When the recording processing is started in this way, the control unit 21 waits for the end of reproduction of the track on the disk player 80 side at step F608, and watches on the partition signal Q based on R channel signal at step F609.

When the partition signal Q is detected by the partition detection unit 30, the processing proceeds to step F610 to perform a processing so that the audio signal input immediately after the time point of detection may form the start point of a segment. In other words, the detection timing of the partition signal Q is retained as the timing of a segment partition point.

For example, when reading of the data of the final address from a track selected by the user, or reproduction of the selected track has ended, the processing is advanced to step F611 to finish the recording processing of the L channel audio signal. Subsequently, the management information shown in FIG.

3(b) is produced at step F612.

Specifically, the management information as shown in FIG. 3(b) is produced so that audio data of one track recorded in the memory 26 is divided into segments with the partition timing retained at step F610. More specifically, an address at which audio data input immediately after the time when the partition signal Q is detected is stored is determined to be the start address of each segment. Of course, an end address forms an address immediately before the start address of the next segment.

At this moment, a skip flag of each segment is set in an initial state (= "1") as shown in FIG. 3(b).

By performing the recording processing as described above, as in the case of the first embodiment described above, a track as a certain teaching material recorded from the disk is recorded in the memory 26 in such a manner as divided into segments as shown in FIG. 3(a).

Therefore, when the operation mode key 13 is operated to switch the operation mode of the reproducing device 1B to the reproduction mode a segment stored in the memory 26 is reproduced, and the reproduction processing described using FIGS. 5 to 9 is performed by the control unit 21. In this case, as in the first embodiment, reproduction will be performed in each of segments and also reproduction of a segment in which a skip flag is raised will be omitted. As a result, a preferable

reproducing operation for a user can be provided.

In the third embodiment, as shown in FIG. 14(a) to FIG. 14(c), if a user purchases a dedicated disk on which a large number of teaching materials are recorded as tracks TK#1 to TK#n, the user can select a teaching material which the user wants to learn to record it in the reproducing device 1B, and he can learn the teaching material using the reproducing device 1B. Assuming that one teaching material (track) has a length for about 3 minutes, the disk can, record voice for 74 minutes and so approximately 25 teaching materials can be recorded on one dedicated disk. Therefore, the user can perform various learnings by obtaining only one dedicated disk.

While, in the processing shown in FIG. 16, voice can be recorded on only a dedicated disk, an ordinary disk can be designed to record voice thereon.

However, in that case, as described above, because one track is recorded without being divided into segments, it is necessary to provide a means for performing a segment division in order to use the track as a teaching material.

For this purpose, for example, it is conceivable that, a silent detection unit is arranged and a section in which an input audio signal is silent for a predetermined period of time (e.g., about 2 to 5 seconds) is regarded as a segment partition point to perform a segment division.

Alternatively, an operating element used when a user

instructs a segment division may further be arranged so that the user may press the operating element with a required timing while monitoring an audio signal in recording. In addition, the control unit 21 may recognize the operation timing with which the operating element for performing a segment partition is pressed as a segment partition point of recorded data, for dividing the recorded data into segments.

These segment divisions are aimed to, especially at making the function of a skip flag effective. When the function of the skip flag is not utilized, the segment division need not be performed. For example, when a user records track reproduction sound as a piece of music in the memory 26, and he wants to repeatedly listen to the piece of music by the reproducing device 1B, there is no need to be divided into segments.

Although the various embodiments have been described so far, various modifications of the structures and processings of the reproducing devices according to the present invention can be effected as a matter of course.

In particular, various methods for skip flag raising operation and various methods for skip flags cleaning operation may be considered.

In the above embodiments, when a clear operation is performed, skip flags of all the segments are cleared. However, for example, when the clear operation is performed while some

segment is specified, a processing may be performed so that only the skip flag of that segment may be cleared.

While the third embodiment describes a case where a teaching material is recorded from a disk player, such a form may be considered that the teaching material is recorded on anther type of media such as a CD (compact disk), and recording is performed from the media.

As described above, in the reproducing device and the recording/reproducing device according to the present invention, when a flag raising operation is performed for some program (e.g., the segment described above) by the operating means, the processing to rise a skip flag corresponding to the program is performed. In reproduction, a program in which no skip flag is raised is reproduced. In other words, reproduction is advanced so that the program in which the skip flag is raised may be omitted. Therefore, when a user performs a flag raising operation for a program which need not be reproduced, the user can inhibit the program from being reproduced without purposely performing a fast forward operation at the reproduction time of the program. This makes the operation simplified and the user can concentrate on the reproduced voice accordingly. Therefore, the reproducing device will be what is extremely suitable for a learning device.

Moreover, the skip flag thus raised for the program can be cleared by an operation, i.e., a program which is temporarily

inhibited from being reproduced can be returned to a reproducable state later. Therefore, even when a user wants later to reproduce a program which is once set in a reproduction skip state later, the user can reproduce the program. For example, when using as a learning device, the user can also confirm an already memorized sentence again.

The fact that it is possible to simply return to a reproducable state by a clear operation as described above, means that a skip flag can be raised easily. When using the reproducing device as a learning device, a user can variously and freely set up programs which are not reproduced depending on the learning level of the user, which enables a meaningful learning.